III MTN WORKSHOP MUSCLE INJURIES AND REPAIR: CURRENT TRENDS IN RESEARCH

September, 27th-28th, 2011

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Assessment and follow-up of muscle injuries by segmental bioimpedance

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3rd MuscleTech Network Workshop
Barcelona, 28th September 2011

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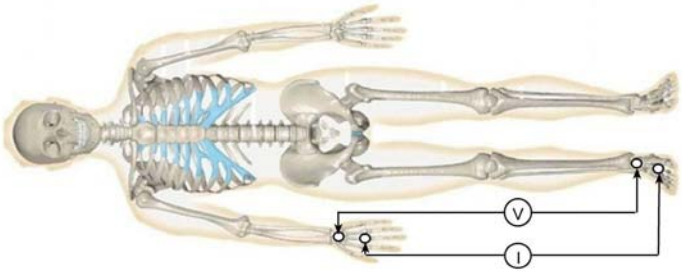
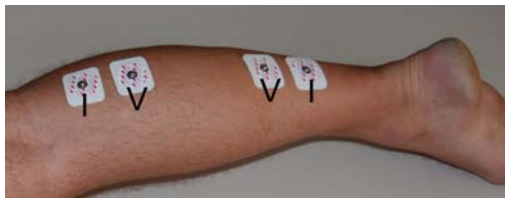
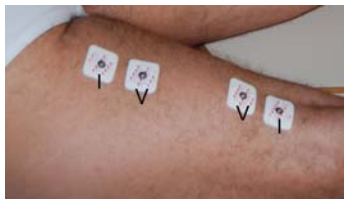
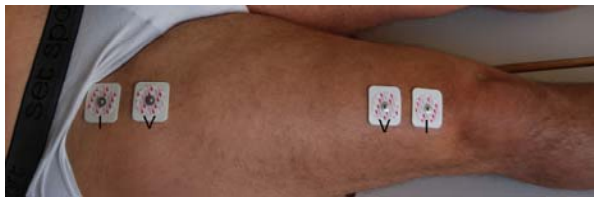
What is Whole-Body and Segmental Bioimpedance?

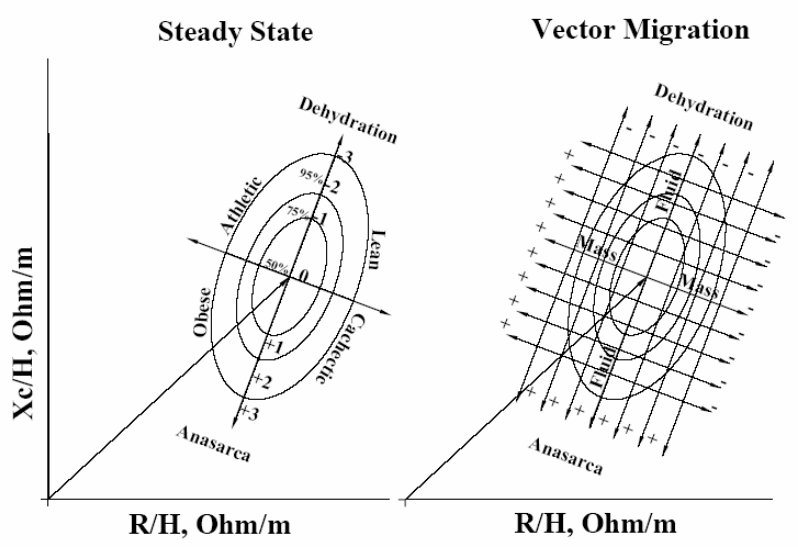








BIVA



RXc-GRAPH
Piccoli A. et al. Kidney Int. 1994; 46: 534-539.

Mono-frequency measurement at 50 kHz.
(Lukaski HC. J Appl Physiol. 1986; 60: 1327-1332).

BIVA (Piccoli A. et al. Kidney Int. 1994; 46: 534-539).

Z/H = (R/H, Xc/H)

R/H *(resistance)*: provides information of the hydration state.

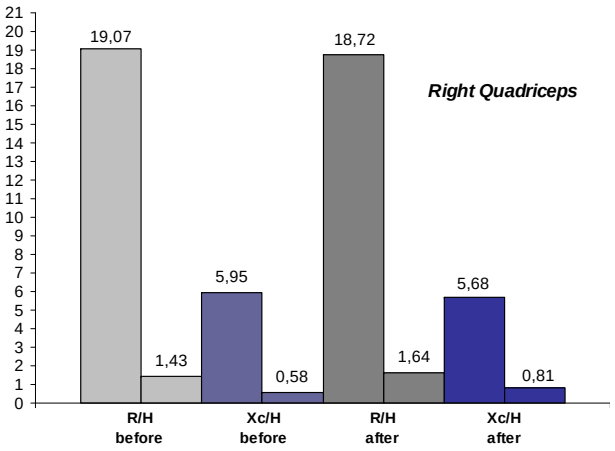
Xc /H (*reactance*): information of the structure of soft tissues.

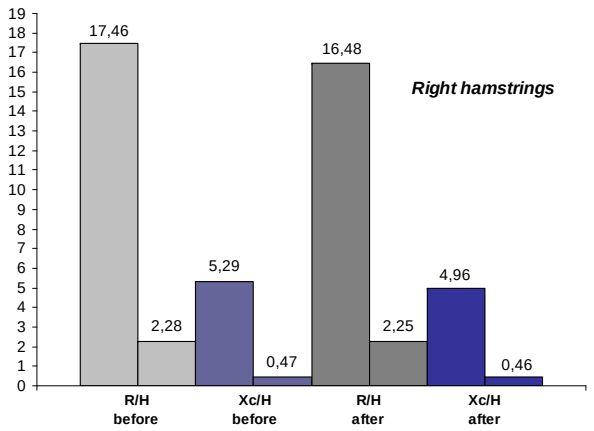
in muscle injury { R = edema, extra-cellular fluid.

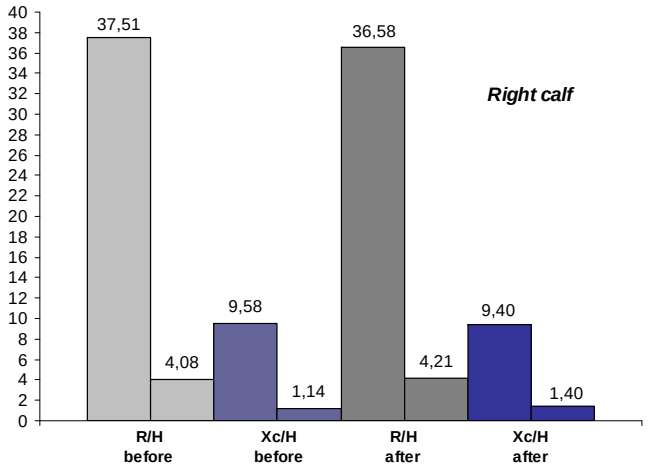
Xc = cell membrane damage.

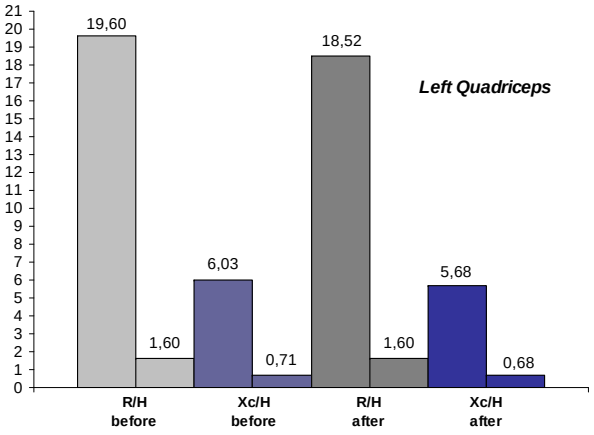
BIA-101 analyzer (AKERN-RJL, Italy).

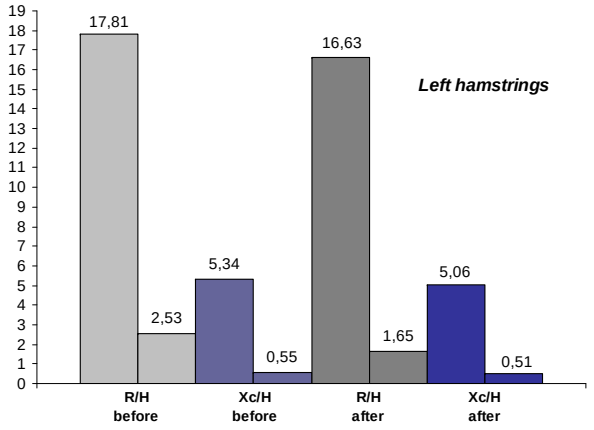
F.C. Barcelona, 2nd football team (n=20)

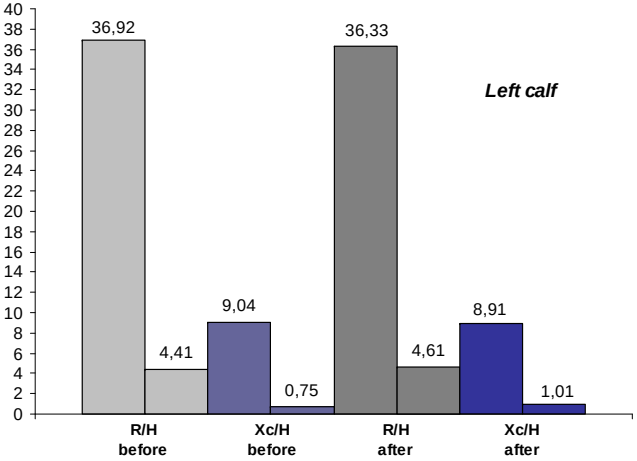












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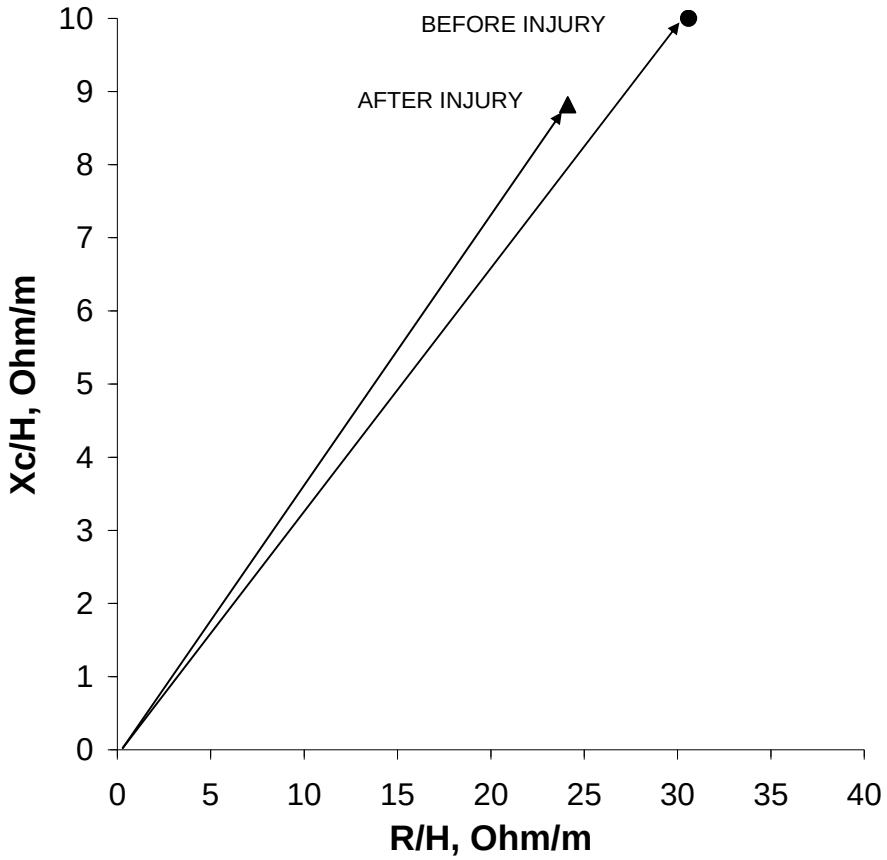
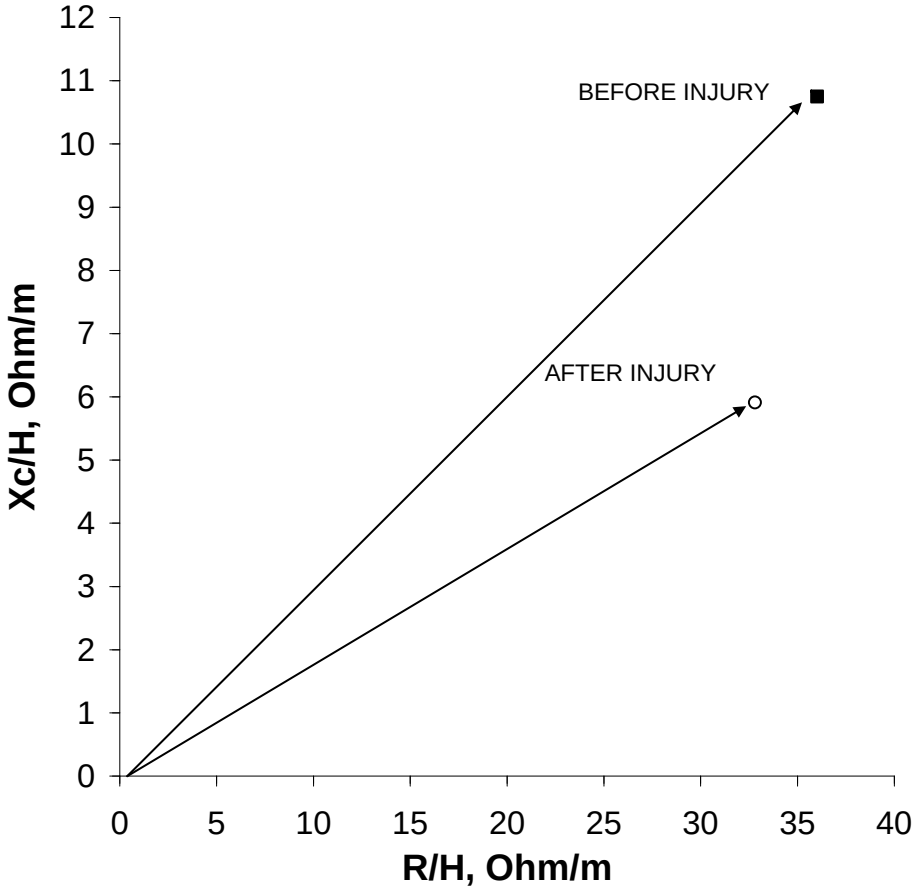
Segmental bioimpedance vector in right calf injury



1st degree right calf injury



3rd degree right calf injury

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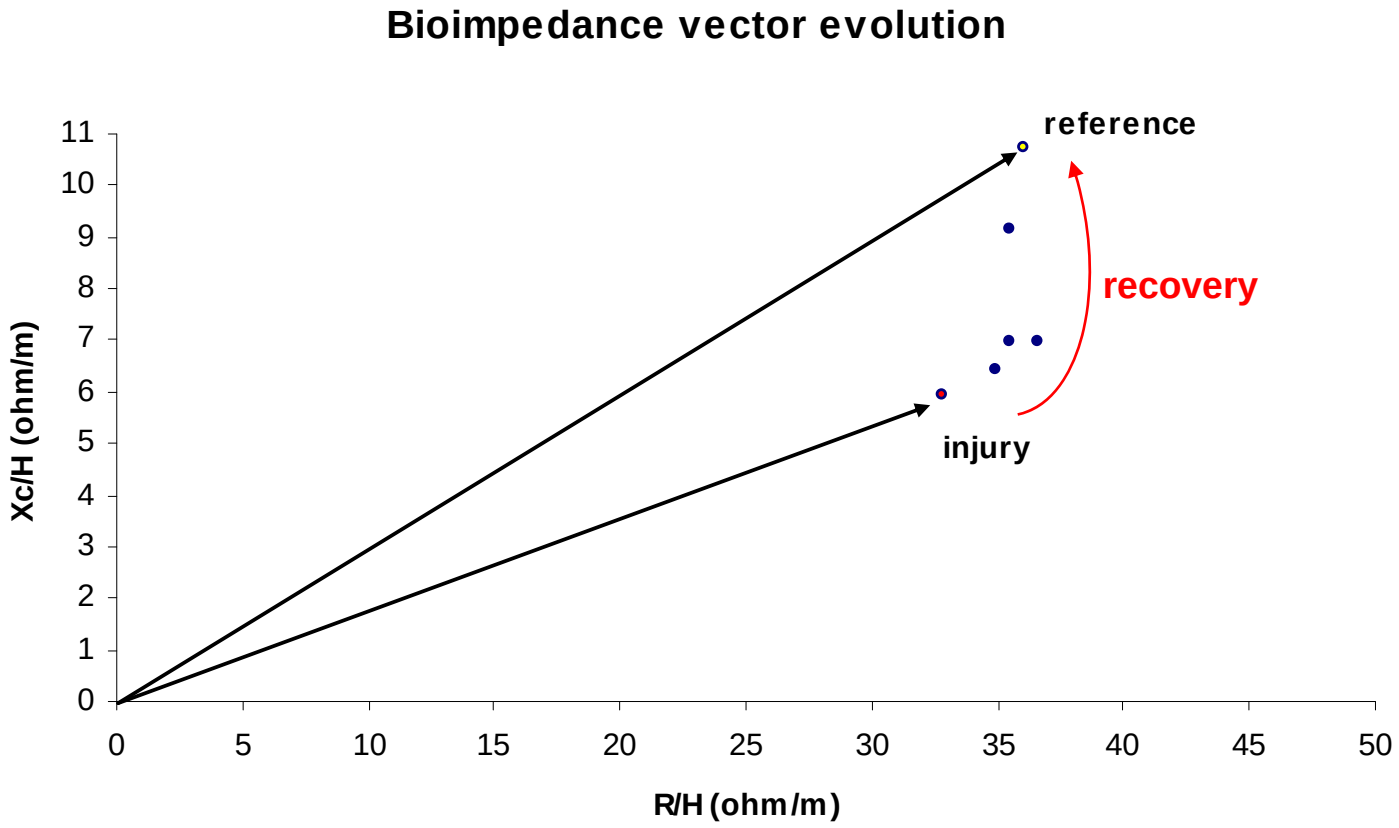

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Conclusions

1) *Athletes develop a well adaptation to the training loads without a modification in the components of bioimpedance vector (R/H and Xc/H).*
2) *In elite well trained athletes their muscle groups are symmetrical (right and left sides), thus each athlete is its own reference for future comparisons.*
3) *We expect a change in the two components of bioimpedance vector (R/H and Xc/H) in front of a muscle injury (2^{ond} and 3rd muscle strain) and only a change in R/H in front of a 1st degree muscle injury.*
4) *Not all the sports have the same pattern of bioimpedance vector by muscle group.*